

REMARKS

The Examiner's withdrawing of the 112 paragraph 2 and 101 rejections is much appreciated.

Without conceding the correctness of the Examiner's 112 paragraph 1 rejection, the applicants have redrafted the claims so as to avoid the term "source," which the Examiner found lacking in written description.

The Examiner writes: "The claims are broadly drawn to a device comprising a substrate and machine readable information. The claims are replete with broad terms and phrases e.g. 'represented by,' 'relating to,' 'associated with,' 'capable of,' 'with respect to.'" The claims have been redrafted to be more precise, and as presently drafted are believed to be precise and intelligible to persons working in the field of laboratory instrumentation.

Claim 1 has been redrafted to better define the claimed invention by expressly reciting certain additional elements to define the device previously claimed, along the lines of claim 108 but with the elements defined more precisely. Claim 108 has been cancelled.

In general terms the following difference exists between the present invention and the disclosures of the cited prior art. The prior inventions, particularly Virtanen's, generally sought to make use of the components of commercial optical storage devices such as CD-ROMs, which were attractive due to their extreme cheapness, for purposes of analytical chemistry. On the basis of that idea, Virtanen filed highly prophetic patent applications in which he sketched out a wide variety of possible applications for these analytical systems based on commercial optical storage devices, making many contentions regarding their expected benefits. The present invention was instead focused on the practicalities of large scale chemistry (where a great many reactions with a great many different chemical entities, especially biomolecules, are performed and/or analyzed automatically), a field which has benefited considerably from the applicants' separately patented invention of acoustic ejection systems suitable for laboratory chemical applications. The present applicants had the insight that a machine of a certain complexity, in many cases a distributed system of microprocessors, is beneficially used to control the performance of large scale chemistry, and that the ability to conveniently record machine-readable information to identify the moieties being operated on and the operations to be performed on them and to efficiently read and make use of that recorded information would be of great value.

The limitations of claim 1 as recited presently are supported by former claims 1 and 108. The limitations are also supported by the recital in the Summary of the Invention that the machine-readable information may include “the identity of at least one of the moieties, information regarding the attachment of the plurality of moieties to the substrate surface, information relating to experimental conditions that describe the use of the plurality of moieties, and/or information relating to the results of such experiments.” They are also supported by the description of hybridization experiments at pages 34 and 35 of the application.

The Examiner has stated in the last Office Action that “the claimed device is not defined as comprising target moieties. Hence, limitations describing the target moieties, do not define or limit the device.” It is respectfully submitted that this statement overstates the law. Where the need to handle or manipulate target moieties is recited in the claim, as in current claim 1, and this need limits the permissible structures which the claim can read on, the target moieties define or limit the claimed device. *See, e.g., Rowe v. Dror*, 112 F.3d 873 (Fed. Cir. 1997) (recital that catheter was an “angioplasty” catheter limits structures which claim reads on).

In the rejection of former claim 108, the Examiner relied on the disclosures of various kinds of detectors in Virtanen, col. 7, lines 10-59 as disclosing the means for reading information and detecting response signals of former claim 108. The roughly corresponding but more detailed recitals of present claim 1 require

- (c) an apparatus for measuring characteristics of the interaction between the plurality of probe moieties and the target moiety
- (d) a machine for
 - (d1) reading some or all of the machine-readable information found on the substrate,
 - (d2) commanding the device to apply a substance or condition that induces a response from the probe and target moieties, taking as an input some or all of the machine-readable information found on the substrate,
 - (d3) receiving the characteristics of the interaction as measured by the apparatus for measuring, and
 - (d4) taking as inputs some or all of the machine-readable information found on the substrate and the characteristics of the interaction, ascertaining some characteristic of the target moiety.

The cited section of Virtanen teaches at most detection of electromagnetic radiation, without stating the purpose of the detection; detecting and counting cells; perceiving alterations to the light transmitting characteristics of an optical waveguide which are caused by “specific binding of analyte”; and a laser-based optical reader. These devices do not appear to relate to aspects of

the interaction between the probe and target moieties, so they do not show that Virtanen meets limitation (c) of claim 1 as presently amended. They certainly are not shown as possessing the characteristics of the machine recited in element (d), including in particular the use of machine-readable information in deciding how to apply a substance or condition to induce a response recited in (d2). For this reason, it is believed that the amendments to claim 1 distinguish it over Virtanen.

Because the Examiner did not reject claim 108 over the other references or combinations of references relied on in the Office Action, it is believed that the amendment of claim 1 to have limitations similar to those of claim 108 overcomes or moots those rejections also.

Because all dependent claims under consideration depend on claim 1, it is believed that the amendment to claim 1 also overcomes or moots all rejections of those claims. However, the following remarks are directed specifically to certain dependent claims where it is believed that there exist additional reasons why the Examiner's rejections are not well taken.

The Examiner in the rejection of claim 3 takes the position that Virtanen and Hammock teach "secure information," presumably meaning information that in some sense ought to be kept secure, such as patient information. However, claim 3 requires "secured" information, i.e., information that is in fact being kept secure, for example by means of encryption. It is quite possible in the systems of Virtanen and Hammock for information such as patient information not to be "secured" in any technological way, for example, if all operations occur in a facility deemed sufficiently secure. The phrase "by technological means" has been added to claim 3 to make this distinction clear. The recital of technological means is supported, for example, by the discussion of smart cards in the application, for example at pages 23-24.

The Examiner in the rejection of claim 14, relating to readability by fluorescence detection, has cited the disclosure of Virtanen col. 38 line 65 to col. 40 line 58. Most of that range of text is not concerned with fluorescence as recited in claim 14. The limited disclosure of fluorescence which Virtanen makes states that a future invention, an inexpensive and commercially viable "blue laser," is needed before fluorescence can be used in the context of his system which seeks to rely on standard laser components which are used in the electronics industry for optical storage purposes. Furthermore, Virtanen discloses fluorescence as a means for detecting what is happening with an analyte, and not for reading machine-readable

information as presently recited in claim 14. For these reasons, it is believed that the Examiner's rejection of claim 14 is not well taken. A similar analysis applies to claim 15.

In the rejection of claims 25 and 26, which depend on claim 24, the Examiner identifies the mesh 510 and screen 610 of Nova col. 42, lines 46-49 and 61-64, with the removable "covering layer" recited in claim 24.

With respect to claim 25, the Examiner appears to be of the view that any type of cover will "encase" what it contains as recited in claim 25, even a porous cover such as that taught by Nova. This view stretches "encase" beyond its ordinary meaning. It is submitted that a porous polypropylene screen or mesh as taught by Nova does not "encase," and thus the Examiner's rejection is not well taken.

With respect to claim 26, the Examiner appears to be of the view that "removable" is a vacuous limitation because the Nova screen "would have been removable by means such as a razor blade or some other screen/mesh cutting means." This reasoning would make any covering layer removable, since there is no covering on earth that cannot be destroyed by some means. For this reason it is submitted that the Examiner's interpretation of "removable" to encompass destruction goes beyond the broadest reasonable construction, and the rejection of claim 26 is not well taken.

The Examiner cited in the rejection of claims 33-36 Hammock col. 5, lines 60-65, and claim 7, for the teaching of " $100\text{ }\mu\text{m}^2$ " densities, stating that this "encompasses the claimed about 1,000,000 moieties/ cm^2 ." However, at the indicated places Hammock only teaches features which are $100\text{ }\mu\text{m}$ in diameter (i.e., roughly speaking at least $8,000\text{ }\mu\text{m}^2$ in area), not features which are $100\text{ }\mu\text{m}^2$ in area. The $100\text{ }\mu\text{m}$ features of Hammock can be arrayed 100 to a centimeter, i.e., 10,000 per cm^2 , but not 1,000,000 / cm^2 . For this reason, it is submitted that the rejection of claims 34-36 is not well taken.

In the Examiner's rejection of claim 94, which requires that "the discrete region of the substrate [on which the machine-readable information is located] is movable with respect to the substrate surface," the Examiner relies on a disclosure from Nova which, according to the Examiner, teaches that "the machine readable information is located on a surface of the substrate that is noncoplanar with respect to the surface adapted for attachment to a plurality of moieties." It is not explained how being noncoplanar implies movability with respect to the substrate

surface as recited in claim 94. For this reason, it is submitted that the rejection of claim 94 is not well taken.

In sum, it is believed that the amendments to the claims overcome or moot the pending rejections. If the Examiner has any questions about the amendment, it would be appreciated if she could please call the undersigned at (650) 330-4912.

Respectfully submitted,

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